

# Spherical Space Forms: Homotopy Types and Self-Equivalences for the Group $(\mathbb{Z}/a \rtimes \mathbb{Z}/b) \times SL_2(\mathbb{F}_p)$

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*Abstract.* Let  $G = (\mathbb{Z}/a \rtimes \mathbb{Z}/b) \times SL_2(\mathbb{F}_p)$ , and let  $X(n)$  be an  $n$ -dimensional  $CW$ -complex of the homotopy type of an  $n$ -sphere. We study the automorphism group  $\text{Aut}(G)$  in order to compute the number of distinct homotopy types of spherical space forms with respect to free and cellular  $G$ -actions on all  $CW$ -complexes  $X(2dn - 1)$ , where  $2d$  is the period of  $G$ . The groups  $\mathcal{E}(X(2dn - 1)/\mu)$  of self homotopy equivalences of space forms  $X(2dn - 1)/\mu$  associated with free and cellular  $G$ -actions  $\mu$  on  $X(2dn - 1)$  are determined as well.

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Received by the editors January 15, 2004.

AMS subject classification: Primary: 55M35, 55P15; secondary: 20E22, 20F28, 57S17.

Keywords: automorphism group,  $CW$ -complex, free and cellular  $G$ -action, group of self homotopy equivalences, Lyndon-Hochschild-Serre spectral sequence, special (linear) group, spherical space form.

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